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(54) TAPE FOR PREVENTING SLEEPINESS

(57)Abstract:

PURPOSE: To provide a tape used for preventing sleepiness and capable of persisting a sleepiness-preventing effect over a long period without deteriorating the pressure sensitive adhesiveness by adding 1-menthol in an amount sufficient for preventing the sleepiness to an adhesive layer containing a styrene-isoprene- styrene block copolymer as a main component.

CONSTITUTION: A tape used for preventing sleepiness and comprising a support and a medicinal agent-containing adhesive layer formed thereon is characterized in that the adhesive layer comprises 1-menthol and an adhesive composition comprising a styrene-isoprene-styrene block copolymer having a styrene content of 12-20wt.%, a liquid paraffin, and an aliphatic hydrocarbon resin.

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CLAIMS

[Claim(s)]

[Claim 1] With the tape for sleepiness prevention on which the binder layer containing a medicine was formed on the base material, the above-mentioned binder layer is a tape for sleepiness prevention characterized by the binder constituent 100 weight section which consists of the styrene-isoprene-styrene block-copolymer 100 weight section, the liquid paraffin 80 - the 200 weight sections, and the alicyclic group system hydrocarbon resin 60 - the 180 weight sections whose styrene content is 12 - 20 % of the weight.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the tape for sleepiness prevention.

[0002]

[Description of the Prior Art] In order to prevent sleepiness, various methods are tried, for example, the chewing gum containing l-menthol is chewed or the method to which perfume, such as l-menthol, is made to emit is mentioned. Since the above-mentioned l-menthol gives cool feeling not only to the smell but to the skin, it is used for the external application pasting agent for much reduction-of-inflammation painkilling.

[0003] However, since it is a crystallized state in ordinary temperature, when l-menthol is volatile, and it blends with a pasting agent in large quantities, it may evaporate in package material and a crystal may deposit. When especially a rubber system binder made a styrene-isoprene-styrene block copolymer a principal component, l-menthol itself worked as a plasticizer, and l-menthol made the styrene layer swell, reduced the cohesive force of a binder layer, and had become the cause of starting a cohesive failure. Therefore, when adding l-menthol to a rubber system binder, there was a trouble that it was difficult to blend in large quantities, maintaining the adhesiveness of a constant level.

[0004] As this cure, by blending a meta-magnesium silicate with A-B-A type thermoplastic elastomer, a meta-magnesium silicate is made to absorb effect-of-a-medicine components, such as a methyl salicylate, and the method of preventing plasticization and softening of a binder layer is indicated (JP,3-17404,B).

[0005] Moreover, the method of blending medicines, such as l-menthol, with the binder constituent which consists of an A-B-A type block copolymer, an alicycle group system petroleum resin, a softener, and a water absorbing polymer is indicated (JP,1-297069,B). Furthermore, the method of blending medicines, such as l-menthol, with the binder constituent which consists of a styrene-isoprene-styrene block copolymer, a liquid paraffin, a tackifier, and a bulking agent is indicated (JP,56-20516,B).

[0006] However, when any above-mentioned method blended comparatively a lot of sufficient l-menthol to prevent sleepiness, the cohesive force of a binder layer declined and there was a trouble that a cobwebbing, the paste remainder, etc. arose.

[0007]

[Problem(s) to be Solved by the Invention] this invention is made in view of the above-mentioned trouble, and the purpose is in offering the tape for sleepiness prevention which can maintain the sleepiness prevention effect over a long time, without checking adhesiveness, though the binder layer which makes a styrene-isoprene-styrene block copolymer a principal component is made to contain l-menthol of sufficient amount to prevent sleepiness.

[0008]

[Means for Solving the Problem] The binder layer to which the tape for sleepiness prevention of this invention contains l-menthol on a base material is formed.

[0009] As a base material used by this invention, a base material which is usually used for the pasting agent can be used, a flexible thing is desirable, for example, a resin film, textile fabrics, a nonwoven fabric, etc. are used suitably.

[0010] As the above-mentioned resin film, for example Polyethylene, polypropylene, A

polyethylene terephthalate, nylon, a polyamide, polyurethane, Polyvinyl alcohol, a polybutadiene, a polybutene, a polyisoprene, Silicon resin, a plasticized polyvinyl chloride, a polyvinylidene chloride, a polyurethane system plasticized polyvinyl chloride, A plasticization vinyl acetate-vinyl chloride copolymer, an ethylene vinylacetate copolymer, An ethylene-vinyl chloride copolymer, an ethylene-methyl-methacrylate copolymer, Acrylic-acid alkyl ester, a styrene-isoprene-styrene block copolymer, (Meta) The thing using a styrene-butadiene-styrene block copolymer, a styrene butadiene rubber, cellulose acetate, an ethyl cellulose, etc. as base polymer is mentioned, these may be used independently and two or more sorts may be used together.

[0011] What makes a base material the synthetic fiber of the base polymer used for the natural fiber; above-mentioned resin films, such as cotton, hemp, and silk, as the above-mentioned textile fabrics and a nonwoven fabric, for example is mentioned.

[0012] If a resin film with textile fabrics, a nonwoven fabric, or permeability is used as the above-mentioned base material, the sleepiness prevention effect will improve further with the invigorating smell of l-menthol which vaporizes through a base material in addition to the percutaneous absorption of l-menthol.

[0013] The binder layer of the tape for sleepiness prevention of this invention consists of a binder constituent containing a styrene-isoprene-styrene block copolymer, a liquid paraffin, and an alicycle group system hydrocarbon resin.

[0014] Since the cohesive force of a binder layer declines, it will be hard coming to dissolve the below-mentioned alicycle group system hydrocarbon resin and adhesion will decline if a cohesive failure happens and it increases at the time of pasting when it decreased and l-menthol is made to contain by high concentration, the styrene content of the above-mentioned styrene-isoprene-styrene block copolymer is limited to 12 - 20% of the weight.

[0015] Moreover, as for the average molecular weight of the above-mentioned styrene-isoprene-styrene block copolymer, 80,000-180,000 are desirable.

[0016] The above-mentioned liquid paraffin is used as a softener for adjusting adhesion, and its thing more than the boiling point of 300 degrees C or more, specific gravity d2020:0.860-0.890, and viscosity 37 centistokes (37. eight degrees C) is desirable.

[0017] a horny layer is exfoliated, in case adhesion will become strong and it will exfoliate from the skin, if the above-mentioned liquid paraffin forms an oily film between a binder layer and the skin, it also has the effect of adjusting the adhesion at the time of ablation and the amount decreases — there is fear, and since adhesion will decline if it increases, it is limited to the 80 - 200 weight section to the styrene-isoprene-styrene block-copolymer 100 weight section

[0018] The above-mentioned alicycle group system hydrocarbon resin is used as a tackifier, and its thing with an average molecular weight [600-800] and a softening temperature of 80-120 degrees C is desirable. If the amount of the above-mentioned alicycle group system hydrocarbon resin decreases, there is not sufficient adhesion grant effect, and since there will be a possibility of adhesion becoming strong, exfoliating a horny layer and causing a skin stimulus, the cohesive force of a binder layer will decline further and a cohesive failure and the paste remainder will happen if it increases, it will be limited to the 60 - 180 weight section to the styrene-isoprene-styrene block-copolymer 100 weight section.

[0019] In the above-mentioned binder constituent, you may add a polybutene further. The above-mentioned polybutene has the work which adjusts adhesion as a tackifier and a softener, and the thing of average molecular weight of 900-3,000 is desirable. Since adhesion will become strong too much if it decreases and adhesion will decline and increase, the amount of the above-mentioned polybutene has desirable 3 - 20 weight section to the styrene-isoprene-styrene block-copolymer 100 weight section. Antioxidants, such as a dibutyl hydroxy toluene, etc. may be added by the above-mentioned binder constituent at other tackifiers, a softener, liquid rubber, and a pan if needed.

[0020] as the above-mentioned tackifier, petroleum-resin; alkylphenol resin; xylene resins, such as a phenol resin; terpene phenol resin; aliphatic system [, such as rosin system resin; alpha pinenes, such as rosin and hydrogenation disproportionation, a polymerization, or an esterified rosin derivative and beta-pinene,], aromatic system, and alicycle group system or a

copolymerization system, etc. are mentioned, for example

[0021] As the above-mentioned softener, a process oil, a liquefied isobutylene, a liquefied polyacrylate, castor oil, cotton seed oil, palm oil, coconut oil, yellow bees wax, a cull navarho, lanolin, etc. are mentioned, and a polyisobutylene, a liquefied polyisoprene, etc. are mentioned as the above-mentioned liquid rubber, for example.

[0022] In the tape for sleepiness prevention of this invention, if the amount of the above-mentioned l-menthol decreases, sufficient sleepiness prevention effect is not acquired, but since it will cause a skin stimulus of the rubor etc. if it increases, it will be limited to 9 - 30 weight section to the above-mentioned binder constituent 100 weight section.

[0023] As a method of preparing the tape for sleepiness prevention of this invention, conventionally, the manufacture method of a well-known adhesive tape can be adopted, for example, a hot-melt coating method, a solvent coating method, a calender coating method, an emulsion coating method, etc. are mentioned. As a describing [above] solvent coating method, the medicine content binder constituent which consists of a binder constituent and l-menthol is dissolved in a suitable solvent, and coating and the method of drying are mentioned on a base material in this.

[0024] As a describing [above] hot-melt coating method, heating fusion of the medicine content binder constituent which consists of a binder constituent and l-menthol is carried out, and spreading and the method of carrying out coating are mentioned on a base material in this. Moreover, after carrying out heating fusion of the medicine content binder constituent and carrying out coating on a releasing paper by the hot-melt coating method, the method of sticking to a base material and imprinting is also usable. Since vaporization of l-menthol is suppressed, the tape for sleepiness prevention obtained by the hot-melt coating method is desirable.

[0025] As for the above-mentioned releasing paper, what was used for the purpose of protection of a binder layer, for example, carried out siliconizing of one side or both sides, such as polyethylene coat paper of fine quality, polyolefine coat glassine, a polyethylene-terephthalate (it is called Following PET) film, and a polypropylene film, is usable.

[0026] The configuration of the tape for sleepiness prevention of this invention can be chosen as freedom, such as the shape of a sheet, band-like, circular, an ellipse form, a lunate, and a rhombus.

[0027] While percutaneous absorption of the l-menthol in a binder layer is carried out by sticking the above-mentioned tape for sleepiness prevention on the circumference of a frame or an eye, a temple, etc., l-menthol which vaporized gradually from the edge of a base material or a binder layer stimulates an eye, a nasal cavity, the skin, etc. moderately, and prevents sleepiness.

[0028]

[Example] this invention is explained per example.

[Production of the tape for sleepiness prevention]

(Examples 1-5 and examples 1-7 of comparison) the styrene-isoprene-styrene block copolymer, the liquid paraffin, the alicycle group system hydrocarbon resin, polybutene, and dibutyl hydroxy toluene (antioxidant) of the amount shown in Table 1 -- in addition, after carrying out heating fusion at 110-130 degrees C for 5 hours and preparing a binder constituent, l-menthol of the amount further shown in Table 1 was added, it mixed uniformly, and the medicine content binder constituent was obtained On the PET film (50 micrometers in thickness) which carried out silicon mold release processing of the above-mentioned medicine content binder constituent, spreading and after carrying out coating and cooling to a room temperature, it imprinted on the plasticization vinyl chloride film with a thickness of 100 micrometers, and the tape for sleepiness prevention was obtained, so that it might become 70 micrometers in thickness.

[0029]

[Table 1]

		粘着剤組成物（重量部）						1-メントール * （重量部）
		SIS		流動 パラフィン	炭化水 素樹脂	ポリ ブテン	老化 防止剤	
		A	B					
実 施 例	1	100	—	150	100	—	2	15
	2	100	—	110	100	—	2	25
	3	100	—	100	80	—	2	25
	4	100	—	110	140	—	2	20
	5	100	—	100	100	8	2	20
比 較 例	1	—	100	110	140	—	2	20
	2	100	—	170	100	—	2	7.5
	3	100	—	85	100	—	2	40
	4	100	—	60	100	—	2	20
	5	100	—	230	100	—	2	20
	6	100	—	100	45	—	2	20
	7	100	—	110	200	—	2	20

* : I-メントールの量は、粘着剤組成物100重量部に対する重量部数

[0030] In addition, each component used in Table 1 is as follows.

Styrene-isoprene-styrene block copolymer (front Naka and SIS showed)

A: "Potash FUREKUSSU TR1107" (shell chemistry company make)

14 % of the weight of styrene contents, average-molecular-weight 125,000B: "potash FUREKUSSU TR1111" (shell chemistry company make)

21 % of the weight of styrene contents, average-molecular-weight 125,000 liquid paraffin "a method of office liquid paraffin" (day product made from ***** Co.)

Alicycle group system hydrocarbon resin (front Naka and the hydrocarbon resin showed) "ARUKON P90" (the Arakawa chemistry company make)

Average molecular weight 630, softening temperature the polybutene of 90 degrees C "polybutene HV300" (the Nippon Oil chemistry company make)

Antioxidant "a dibutyl hydroxy toluene" (Orient chemistry company make)

I-menthol "food additive I-menthol" (the Ogi Pharmaceuticals company make)

[0031] [Evaluation of the tape for sleepiness prevention] The following evaluation was performed per [which was obtained in the above-mentioned examples 1-5 and the examples 1-7 of comparison] tape for sleepiness prevention, and the result was shown in Table 2.

(1) 180-degree peel strength JIS It measured based on Z0237.

(2) The tape for sleepiness prevention with an organoleptics radius of 1cm pierced circularly was stuck on five adults' evaluator's frame or temple, and the sleepiness prevention effect was judged in accordance with the following error criterion in after [pasting] 0.5 hours, 1 hour, 1.5 hours, 2 hours, 2.5 hours, and 3 hours.

<Error criterion> There is the moderate feeling of a stimulus to +:menthol smell and the skin, and sleepiness is prevented.

**: Although there is almost no menthol smell, there is the moderate feeling of a stimulus to the skin.

- : there is no feeling of a stimulus to a menthol smell and the skin.

Moreover, the cobwebbing at the time of exfoliating the tape for sleepiness prevention and the existence of the paste remainder to the skin, and the existence of keratin exfoliation were judged in accordance with the following error criterion after the organoleptics end.

<Error criterion> (a cobwebbing and existence of the paste remainder to the skin)

O : — paste-remainder-less x: to a cobwebbing and the skin — a cobwebbing or those with paste remaining to the skin (existence of keratin exfoliation)

O most :keratin exfoliations — nothing x:keratin exfoliation — many [0032]

[Table 2]

		180度 剝離強度 (g/10mm)	官 能 試 験								糸引き 糊残り	角質 剝離
			0.5 時間	1.0 時間	1.5 時間	2.0 時間	2.5 時間	3.0 時間				
実 施 例	1	128	+	+	+	±	-	-	○	○		
	2	143	+	+	+	+	+	±	○	○		
	3	134	+	+	+	+	+	±	○	○		
	4	152	+	+	+	+	±	-	○	○		
	5	148	+	+	+	+	±	-	○	○		
比 較 例	1	38	(貼付後10分以内に剝離、脱落)						○	○		
	2	135	-	-	-	-	-	-	○	○		
	3	144	+	(刺激感強く、30分以内で中止)						○	○	
	4	292	+	+	+	±	-	-	×	×		
	5	53	+	(貼付後55分以内に剝離、脱落)						○	○	
	6	61	+	(貼付後55分以内に剝離、脱落)						○	○	
	7	464	+	+	+	+	±	-	×	×		

[0033]

[Effect of the Invention] The tape for sleepiness prevention of this invention is as above-mentioned, and since l-menthol of sufficient amount to prevent sleepiness can be made to contain, without spoiling adhesiveness, the sleepiness prevention effect is maintainable over a long time.

[Translation done.]